

THREE SPECIES OF MEXICAN *KROMBEINIA* HAVING
AN ELONGATED TEGULA WITH AN EXTENDED APICAL ANGLE^{1,2}
(HYMENOPTERA: TIPHIIDAE)

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ABSTRACT—*Krombeinia evansi*, n. sp., from Mexico is described and illustrated and notes are given for *K. veracruzae* Allen and Krombein and *K. nayarita* Allen and Krombein.

The author has recently identified a long series of males of a new species of *Krombeinia* which runs in key by Allen and Krombein (Allen & Krombein, 1964) to couplet 11. Since there was some doubt as to the identity of this species, both Krombein and Allen compared it with the holotype of *veracruzae* Allen & Krombein and Allen compared it with paratypes of *nayarita* Allen & Krombein from San Blas, Nayarit, the type locality of *nayarita*. It is a new, undescribed species which I have named in honor of Dr. Howard E. Evans who has collected a fine series, one of many such series of tiphine species he has collected from western North America. It is difficult to overestimate the value of long series in determining the speciation within this group.

***Krombeinia evansi*, n. sp.**

(Figs. 1, 2)

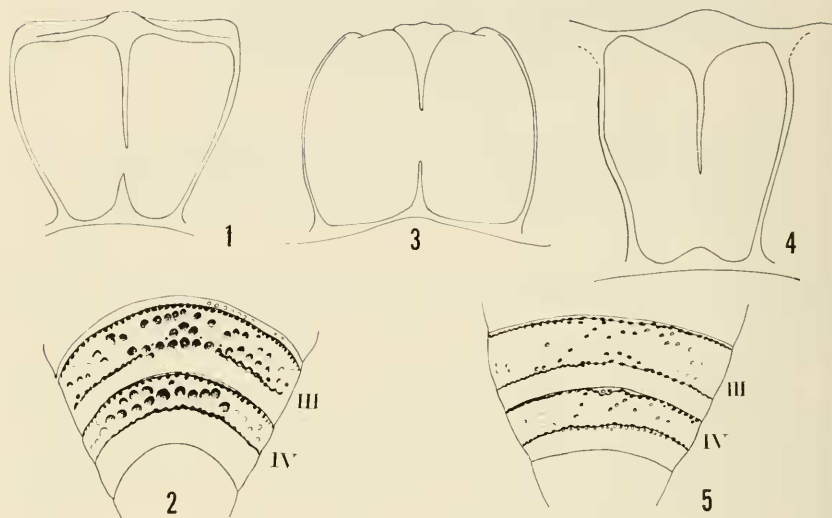
Male.—Front, to level of lowest ocellus with coarse punctures of first-degree density, but not contiguous, interspersed with numerous secondaries.

Dorsal pronotum with coarse, round punctures ranging in density from third- to first-degree; medially apical two-fifths impunctate. Lateral pronotum with anterior process very prominent, particularly the broad, massive tooth at humeral angle; disc crossed by a fairly distinct groove. Mesopleuron on outer disc with primary punctures separated in most directions by much more than their average diameter; with minute secondaries everywhere somewhat more numerous than primaries. Tegula conspicuously elongated with parallel sides and a prominent extension of inner apical angle; 2.0 times as long as middle width (3 measured were 2.0, 1.9, and 2.1). Forewing hyaline.

Dorsal propodeum with areola (fig. 1) usually tapered with nearly straight sides, length about equal to basal width and about one and one-half times apical width; area beside areola highly polished; transverse carina very high and prominent. Lateral propodeum with rugulae on upper part fine, widely separated and generally parallel; lower part flat, polished. Posterior aspect of propodeum

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Figs. 1-5, *Krombeinia* spp.: 1, *evansi*, n. sp. from Jacotepec, Jalisco, propodeal areola; 2, same, abdominal terga III and IV; 3, *nayarita* Allen and Krombein from San Blas, Nayarit, propodeal areola; 4, *veracruzae* Allen and Krombein from Santiago Tuxtla, Vera Cruz, propodeal areola; 5, same, abdominal terga III and IV. (Illustrations by Mary H. Fuges.)

slightly dished with an encircling rim of projecting carinae. Tergum 1 with anterior aspect almost perpendicular to body axis, highly polished, almost impunctate; transverse carina high and scalariform; dorsum with very coarse punctures, somewhat uniformly distributed. Tergum 2 with coarse punctures of nearly uniform size and distribution. Terga 3 and 4 (fig. 2) each with an anterior and posterior row of punctures closely spaced along an escarpment, intermediate area irregularly set with very large, dimpled punctures. Support of terminal fork broadly inflated; its impunctate area not continued as an elongated median vitta.

Length, 6.6 to 11.2 mm.

Female.—Vertex punctures over a broad median area of close first-degree density without a median row of minute punctures. Front on lower third with punctures of first- and second-degree density, on upper third with some interspaces as wide as an ocellus; median carina high enough to be visible in profile.

Dorsal pronotum with transverse carina complete; punctures largely of first-degree density. Lateral pronotum only obscurely sculptured with fine aciculations, scattered punctures and faint irregular rugulae. Mesopleuron with prepectal carina present from near tegula to ventral aspect. Tegula similar to that of male, elongate, with parallel sides, and a prominently extended posterior inner angle. Membrane of forewing only faintly infumated; finely and sparsely hirsute.

Dorsal propodeum with areola tapered to an apex about three-fourths width of base; area beside areola almost bare of microsetae. Punctures of intermediate terga, especially 3 and 4, very coarse with conspicuously polished interspaces.

Length, 8.4 to 11.2 mm.

Holotype.—♂; Guadalajara, Jalisco, 23 to 28-VII-'65 (H. E. Evans) [USNM].

Allotype.—♀; Guadalajara, Jalisco, 17 to 20-VII-'65 (H. E. Evans) [USNM].

Paratypes.—14 ♂♂, 3 ♀♀; same data as holotype [Evans]. 7 ♂♂, 4 ♀♀; same data as allotype [Evans]. 2 ♂♂, 6 ♀♀; Guadalajara, Jal., 10 to 11-VIII-'65 (H. E. and M. A. Evans). 2 ♂♂; 9 mi. south of Guadalajara, Jal., 24-VIII-'65 (H. E. Evans) [Evans]. 3 ♂♂; 9 mi. south of Guadalajara, Jal., 29-VII-'65 (H. E. Evans) [Evans]. 1 ♂; Pt. Barrancas, Jal., 9-VIII-'65 (H. E. and M. A. Evans) [Evans]. 3 ♂♂; 11 mi. north of Tabasco, Zacatecas, 5,500 ft., 12-VIII-'65 (H. E. Evans) [Evans]. 2 ♂♂; Arroyo Rafelion, near Compostela, Nayarit, 8-VII-'65 (H. E. Evans) [Evans]. 10 ♂♂; Jocotepec, Jal., 5,000 ft., 11-VII-'59 (H. E. Evans) [CU]. 1 ♂; previously labeled paratype of *K. nayarita*, La Primavera, Jal., 8-VIII-'56 (R. and K. Dreisbach).

Discussion.—*K. evansi* in both sexes differs from other described species of *Krombeinia* except *nayarita* and *veracruzae* on having a much elongated tegula which is parallel-sided and has a prominent extension of the inner apical angle. The male of *evansi* is generally smaller than that of *nayarita* and does not have a barrel-shaped areola. The female is also smaller but structurally is very close to *nayarita*. In specimens I have examined the female of *evansi* has a slightly less densely punctate front, dorsal pronotum and scutum, and it has a nearly hyaline forewing with only fine, sparse, hairs.

***Krombeinia veracruzae* Allen and Krombein**

(Figs. 4, 5)

Allen and Krombein, 1964, p. 220.

Discussion.—The holotype from Santiago, Tutla, Vera Cruz was recently reexamined, and found to agree in detail with the original description except that a sensorial stripe occurs on the posterior tibia, not on the coxa. This species is distinguished from *evansi* by the infumated forewing; by finer more widely separated punctures of front and thorax; by a longer and more slender areola (fig. 4); and most conspicuously by much finer punctation of the abdominal terga (fig. 5). I have identified as this species 3 males collected by D. Cavagnaro and M. E. Irwin from Quezaltepeque, El Salvador, two on August 4, 1963, and the other on June 22, 1963 [Univ. of California, Davis].

***Krombeinia nayarita* Allen and Krombein**

(Fig. 3)

Allen and Krombein, 1964, p. 218.

Discussion.—*K. nayarita* males average larger than either *evansi* or *veracruzae* (10.8 to 12.0 mm.). The male consistently has a short,

barrel-shaped areola (fig. 3); it has a relatively low anterior process on the lateral pronotum; and in common with *evansi*, it has coarse punctures on the abdominal terga. The female is also larger than the other two species. It has heavily infuscated forewings which are frequently densely pubescent.

The holotype of this species is from San Blas, Nayarit. Specimens have been identified from several localities distributed through the states of Oaxaca, Guerrero, Morelos, Michoacan, Jalisco, Nayarit, San Luis Potosi, Vera Cruz, and Tamaulipas. I have identified a total of 26 males and 13 females.

REFERENCE

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BIOLOGICAL NOTES ON THE BEE *TETRALONIA MINUTA* AND ITS CLEPTOPARASITE, *MORGANIA HISTRIO TRANSVAALENSIS* (HYMENOPTERA: ANTHOPHORIDAE)

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ABSTRACT—The biologies of the South African eucerine bee *Tetralonia minuta* Friese and of its nomadine parasite, *Morgania histrio transvaalensis* Bischoff, are discussed.

On a recent trip to South Africa I had a chance to observe briefly the nesting habits of a bee belonging to the genus *Tetralonia* Spinola and the biology of its cuckoo bee parasite *Morgania* Smith. Because little is known about the biology of either genus, these notes are presented here. Adults of the *Tetralonia* are conspecific with the type of *T. minuta* Friese in the Institut für Spezielle Zoologie und Zoologisches Museum, Humboldt-Universität, Berlin, and those of the *Morgania* agree with the male type of *M. (Omachthes) histrio transvaalensis* Bischoff in the Transvaal Museum, Pretoria, Republic of South Africa.

Adults, immature stages, and samples of cells and cocoons are in the collection of the American Museum of Natural History. The research for this paper was supported by National Science Foundation Grant GB-5407X.

BIOLOGY OF *Tetralonia minuta* Friese

Description of Nesting Area: Mr. Denis Brothers found this species nesting in the ground at 3 miles west of Grahamstown, Republic of